



Patent

HM-388

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Günter Knepp et al.

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For: METHOD AND DEVICE FOR GUIDING AND SUPPORTING A THIN
SHEET OF METAL STRIP

Examiner: Clark F. Dexter

Art Unit: 3724

Mail Stop: Appeal Brief-Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

S I R:

This appeal is taken from the Final Action mailed February 5,
2008.

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Real Party in Interest

The real party in interest in the above-identified application is SMS Demag AG, Eduard-Schloemann-Strasse 4, 40237 Düsseldorf, Germany, pursuant to an assignment recorded March 12, 2001 , under Reel/Frame 011622/0748.

Related Appeals and Interferences

There are no related appeals or interferences of which Applicant is aware regarding the above-identified application.

Status of Claims

Claims 1 to 10 have been canceled. Claims 11 to 23 are pending in the application. Of these claims, claims 13, 18 and 21 to 23 are withdrawn from consideration.

Claims 11, 12 and 14 to 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read in view of Kobayashi et al and Shearon. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Read in view of Kobayashi et al and Shearon, as applied to claim 11, and further in view of

German publication 944919. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over German publication 944919 in view of Read and Shearon. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read in view of German publication 944919 or Obenshain, and in view of Shearon.

Status of Amendments After Final Rejection

A Response to the final Office Action dated February 5, 2008, was filed on June 10, 2008. In an Advisory Action dated May 22, 2008, the Examiner indicated that he considered the Response after final rejection but that the Response does not place the application in condition for allowance.

Summary of the Claimed Subject Matter

The claimed invention will now be described with reference to the drawings being made by way of reference numerals.

Independent claim 11

The present invention is directed to a method for guiding and

supporting a thin sheet metal or metal strip 1 during transport across a conveying device 10 illustrated in Fig. 2 and described in the first full paragraph on page 8 of the specification. The thin sheet metal or metal strip 1 is also conducted through drums selected from the group consisting of a transport drum and a blade carrier drum as described in the third paragraph on page 7 of the specification. The thin sheet metal or metal strip 1 is conducted as described during, before or after a cutting process carried out by shears 3, as illustrated in Fig. 3.

The method comprises the following steps:

As described in the third paragraph on page 7 of the specification, a liquid or gaseous medium is guided under pressure through supply channels 4 in an interior of the drums 7, 8 to jet nozzles 5 at a periphery of the drums 7, 8 and jet bundles 2, 2' are produced exiting from the jet nozzles 5, shown in Fig. 2. As is clear from the drawing, the drums 7, 8 are arranged so as not to touch.

As discussed in the first two lines on page 5, the method further includes loading at a slant or at a substantially perpendicular angle relative to the sheet metal or metal strip 1 at least an under sight of the sheet metal or metal strip 1 with the jet bundles 2, 2' before support areas of the drums 7, 8,

behind support areas of the drums 7, 8, before and behind support areas of the drums 7, 8 or as closely as possible adjacent to the blades 6 provided on the blade carrier drums 8, as discussed in the first full paragraph on page 4 of the specification. This supports and guides the sheet metal or strip 1 by impulse energy provided by the jet bundles 2, 2', wherein the blade carrier drums and the blades are part of the shears, as discussed in the first full paragraph on page 8 of the specification.

Using a valve 9, discussed in the paragraph bridging pages 9 and 10 of the specification, the jet bundles 2, 2' oriented against the sheet metal or metal strip 1 are limited to a limitable angular position of the drums 7, 8.

Independent claim 19

The claims are also directed to a device for guiding and support a thin sheet metal or metal strip 1 for performing the method described above.

The device comprises:

a conveying device 10 for conveying the sheet metal or metal strip 1 shown in Fig. 2 and described in the first full paragraph on page 8 of the specification as a rolling table 10.

Drums which are either transport drums as discussed in the third paragraph on page 7 of the specification or blade carrier drums 8 mentioned in the first full paragraph on page 8 of the specification are provided so as not to touch.

As discussed in the third paragraph on page 7, the drums are provided at a periphery thereof with jet nozzles 5 arranged in at least one row parallel to an axis of the drums. The drums each have an interior and supply channels 4 arranged in the interior, wherein the supply channels 4 are connected to a source 25 of a medium to be supplied under pressure, wherein the source 25 is provided external to the drums 7, 8, as described in the third paragraph on page 7 and in the paragraph bridging pages 7 and 8 of the specification, respectively. As described in the first paragraph on page 7, the jet nozzles 5 are connected by connecting channels 21, 21' to the supply channels 4 and are oriented against at least one of the top surface and bottom surface of the sheet metal or the metal strip. Finally, the device includes at least one pump 22 and at least one valve 9 arranged between the supply channels 4 and the source 25, as described in the paragraph bridging pages 7 and 8. The valve includes the connecting channels.

Grounds of Rejection to be Reviewed on Appeal

The following grounds are presented for review:

Whether claims 11, 12, 14 to 16 are unpatentable under 35 U.S.C. 103(a) over Read in view of Kobayashi and Shearon.

Whether claims 19 and 20 are unpatentable under 35 U.S.C. 103(a) over German publication 944919 in view of Read and Shearon.

Whether claims 19 and 20 are unpatentable under 35 U.S.C. 103(a) over Read in view of German publication 944919 or Obenshain, and in view of Shearon.

Grouping of Claims

Claims 12 and 14 to 17 stand or fall with claim 11, and claim 20 stands or falls with claim 19.

Argument

The rejection of claims 11, 12 and 14 to 16 under 35 U.S.C.
103(a) as being unpatentable over Read in view of Kobayashi and
Shearon:

Applicants submit that the references relied upon by the Examiner as teaching the guiding structure (i.e. Read and German Publication 944 919) are not relevant art since they deal with fabric and paper webs. Due to the completely different physical characteristics of paper and fabric compared to metal, there is no indication that any structure for guiding paper or fabric would be in any way appropriate for use with metal. Thus, it is submitted that these references do not suggest the method of guiding metal strip according to the present invention.

The patent to Shearon discloses a rotary web chopper. The device of Shearon is for high speed transverse separation of individual sheets from a continuous web using cooperating cutters arranged on oppositely rotating shafts. The web is fastened and wrapped around one of the cutting wheels. The blade on the other shaft has a shaped outer surface that defines an epitrochoidal profile along its entire length. The blade on the other shaft has a straight cutting edge that defines an accurate cutting edge. The

Shearon patent concerns itself with the provision of a vacuum to the knife drum of the type taught by Shearon. The Shearon patent has no disclosure concerning a device for guiding and supporting sheet metal or metal strip as is taught by the presently claimed invention. Furthermore, the web wraps around a plurality of rolls before it is separated by the knife 18. Since the knife dips into the counter roll 34, the web must be blown out of the counter roll 34. This is accomplished by the jets 51, which are only provided in the counter roll 34. This is shown in Figs. 12a to 12f. The knife roll 29 has no jets. Additionally, the web is not supported by the jets, but instead is only blown out of the cutting region.

The patent to Kobayashi et al. discloses an apparatus and method for cutting a fabric web with a rotating cutter including a cutting roll having a suction chamber and an exhaust chamber. The chambers are arranged in the interior of the roll and are provided with first, second and third air jet openings that are provided with openings in the outer periphery of the knife drum. Furthermore, the jets do not serve to support the web, but instead are provided to loosen the web from the knife drum or prevent the web from attaching to the knife drum.

The patent to Read discloses means for controlling and

directing moving sheets or webs. This patent also deals with fabric webs. Thin sheet metal and metal strip are considerably heavier than fabric or paper webs and thus a reference that deals with fabric or paper webs provides no teaching concerning metal sheet or metal strip and also provides no motivation for a method dealing with metal in view of the completely different conditions being dealt with that are not faced with fabric and paper. Furthermore, in Read the web W is transported vertically. Due to its own weight the web is guided to the gap between the two cutting rolls. Only under the blade is the web impacted by left and right jets so that the web is folded in a guide direction 1. Contrary to the present invention, the jets of Read do not support the web since the web is not placed on a conveying device, but instead hangs freely.

The Examiner combined Read with Kobayashi et al. and Shearon in determining that claims 11, 12 and 14-16 would be unpatentable over such a combination. Applicant respectfully submits that none of these references, taken alone or in combination, provides any teaching concerning a method for guiding and supporting a thin sheet metal or metal strip during transport across a conveying device and through drums selected from the group consisting of a transport drum and a blade carrier drum during, before or after a

cutting process carried out by shears using jets, as in the presently claimed invention. Without some teaching concerning supporting metal strip or sheet metal with jets, the references do not teach or suggest the present invention.

The rejection of claims 19 and 20 under 35 U.S.C. 103(a) as being unpatentable over GP '919 in view of Read and Shearon:

German reference DE 944 919 discloses a transverse cutting of paper webs. An air jet 10 is only located in the lower knife roll 5. This jet 10 is intended to lift the front edge of the cut paper web from the cutting blade. There is no suggestion of a support or guiding function by the jet(s). There is no teaching, as found in the presently claimed invention, of jet nozzles in the upper and lower drums both before and after the blades for lifting and supporting a metal strip. Furthermore, the metal strip of the present invention is transported by its own weight to the rollers of the transport device 10, whereas in the reference the paper web, after cutting, must be transported between an upper and lower transport belt.

The Examiner combined DE '919 with Read and Shearon in determining that claims 19 and 20 would be unpatentable over such a combination. Applicant respectfully submits that none of these references, taken alone or in combination, provides any teaching concerning a device for guiding and supporting a thin sheet metal or metal strip during transport across a conveying device and through drums selected from the group consisting of a transport drum and a blade carrier drum during, before or after a cutting process carried out by shears using jets, as in the presently claimed invention. Without some teaching concerning a construction that supports metal strip or sheet metal with jets, the references do not teach or suggest the present invention.

The rejection of claims 19 and 20 under 35 U.S.C. 103(a) as being unpatentable over Read in view of GP '919 or Obenshain, and in view of Shearon:

The arguments and comments made above relative to Read, GP '919 and Shearon apply equally here and are incorporated by reference.

The patent to Obenshain also does not teach the invention as

discussed previously in connection with the other rejections.

Furthermore, Obenshain adds nothing to the teachings of Read and Shearon so as to arrive at the presently claimed invention.

Applicant respectfully submits that none of these references, taken alone or in combination, provides any teaching concerning a method for guiding and supporting a thin sheet metal or metal strip during transport across a conveying device and through drums selected from the group consisting of a transport drum and a blade carrier drum during, before or after a cutting process carried out by shears using jets, as in the presently claimed invention.

Without some teaching concerning supporting metal strip or sheet metal with jets, the references do not teach or suggest the present invention.

Conclusion

Accordingly, in view of the above considerations, it is respectfully submitted that the Examiner's rejection of the claims are in error and should be reversed.

The amount of \$510.00 to cover the fee for filing an appeal brief has been previously paid. Any additional fees or charges required at this time in connection with this application should be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

Dated: July 15, 2009

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on July 15, 2009

By: 
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Date: July 15, 2009

Claims Appendix

Claims 1-10. (Canceled)

11. (Previously presented) A method for guiding and supporting a thin sheet metal or metal strip (1) during transport across a conveying device (10) and through drums selected from the group consisting of a transport drum and a blade carrier drum during, before or after a cutting process carried out by shears (3), the method comprising the steps of:

guiding a liquid or gaseous medium under pressure through supply channels (4) in an interior of the drums (7, 8) to jet nozzles (5) at a periphery of the drums (7, 8) and producing jet bundles (2, 2') of the liquid or gaseous medium exiting from the jet nozzles (5), the drums (7, 8) being arranged so as not to touch;

loading at a slant or at a substantially perpendicular angle relative to the sheet metal or strip (1) at least an underside of the sheet metal or strip (1) with the jet bundles (2, 2') before support areas of the drums (7, 8), behind support areas of the drums (7, 8), before and behind support areas of the drums (7, 8) or as closely as possible adjacent to blades (6) provided on the blade carrier drums (8) and thereby supporting and guiding the sheet metal or strip (1) by impulse energy provided by the jet

bundles (2, 2'), the blade carrier drums and the blades being part of the shears;

limiting the jet bundles (2, 2') oriented against the sheet metal or metal strip (1) to a limitable angular position of the drums (7, 8) using a valve (9).

12. (Previously presented) The method according to claim 11, wherein the valve (9) is arranged at an end face of the drums (7, 8).

13. (Withdrawn) The method according to claim 11, further comprising the step of detecting a strip head or a strip cut and loading the strip head or strip cut only briefly with the jet bundles (2, 2').

14. (Previously presented) The method according to claim 11, wherein the jet nozzles of the transport drums are briefly successively loaded with the liquid or gaseous medium during a pass of a strip head between the transport drums.

15. (Previously presented) The method according to claim 11, wherein the shears are chisel shears having the blade carrier drum (8) provided with a cutting chisel (11) and a counter drum (8').

formed as an anvil, wherein the sheet metal or strip (1) to be cut is loaded with at least one of the jet bundles (2, 2') out of the blade carrier drum (8) and the counter drum (8'), respectively.

16. (Previously presented) The method according to claim 15, wherein the jet bundles (2, 2') load the sheet metal or metal strip from above and below at least at one location selected before the cutting plane (y-y), before and behind the cutting plane (y-y), or behind the cutting plane (y-y).

17. (Previously presented) The method according to claim 11, wherein the shears are shearing-off shears (13) provided with the blade carrier drums (8, 8') each having a blade (6, 6') with an edge, the blades being arranged so that the edges are oppositely positioned, wherein the jet bundles (2, 2') load the sheet metal or strip (1) from above and below at least at one location selected before the cutting plane (y-y), before and behind the cutting plane (y-y), or behind the cutting plane (y-y).

18. (Withdrawn) The method according to claim 15, further comprising the steps of:

determining entry of a strip head (16) of the sheet metal or strip (1) in the area of the guide wedge (15) arranged

stationarily upstream of the chisel shears (3) and determining an advancing speed of the strip head (16) by a signaling device (19);

arranging at least one row of jet nozzles (5) in the guide wedge (15) and loading and guiding the strip head (16) from below by orienting the jet nozzles (5) such that jet bundles (2') exiting from the jet nozzles (5) impact approximately perpendicularly against the sheet metal or strip (1).

19. (Previously presented) A device for guiding and supporting a thin sheet metal or metal strip (1) for performing the method according to claim 11, the device comprising:

a conveying device (10) for conveying the sheet metal or metal strip;

drums selected from the group consisting of transport drums and blade carrier drums (7, 8), the drums (7, 8) being arranged so as not to touch;

the drums each having a periphery provided with jet nozzles (5) arranged in at least one row parallel to an axis of the drums;

wherein the drums each have an interior and supply channels (4) arranged in the interior, wherein the supply channels (4) are connected to a source (25) of a medium to be supplied

under pressure, wherein the source (25) is provided external to the drums (7, 8);

wherein the jet nozzles (5) are connected by connecting channels (21, 21') to the supply channels (4) and are oriented against at least one of a top surface and a bottom surface of the sheet metal or the metal strip;

at least one pump (22) and at least one valve (9) arranged between the supply channels (4) and the source (25), the valve including the connecting channels.

20. (Previously presented) The device according to claim 19, wherein the valve is arranged at an end face of each of the drums (7, 8).

21. (Withdrawn) The device according to claim 19, wherein the conveying device (10) is a rolling table (10), wherein the blade carrier drums form chisel shears (3), and wherein guide wedges (15) are arranged near the chisel shears and comprise jet nozzles (5) and supply channels (4) for the medium, the device further comprising:

a media supply line (29) comprising a pressure pump, connecting the jet nozzles to the source (25);

a signaling device (19), monitoring entry of the sheet metal or metal strip, arranged above the sheet metal or metal strip (1), wherein the signaling device (19) is connected by a control signal line (26) to a motor of the pump (27) and communicates with the signal line (26) with the motor (28) of the pump (27).

22. (Withdrawn) The device according to claim 21, wherein a width of the jet nozzles (5) is adjustable.

23. (Withdrawn) The device according to claim 21, wherein the conveying device is a rolling table and wherein the jet nozzles are distributed radially on a periphery of the transport drums.

Evidence Appendix

N.A.

Related Proceedings Appendix

There are no related proceedings.